



A 10-year time-series analysis of respiratory and cardiovascular morbidity in Nicosia, Cyprus: The effect of short-term changes in air pollution and dust storms

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Abstract:

BACKGROUND: To date, a substantial body of research has shown adverse health effects of short-term changes in levels of air pollution. Such associations have not been investigated in smaller size cities in the Eastern Mediterranean. A particular feature in the region is dust blown from the Sahara a few times a year resulting in extreme PM₁₀ concentrations. It is not entirely clear whether such natural phenomena pose the same risks. **METHODS:** The effect of changes in daily levels of particulate matter (PM₁₀) and ozone (O₃) on hospitalization for all, cardiovascular and respiratory causes in the two hospitals in Nicosia during 1 January 1995 and 30 December 2004 was investigated using generalized additive Poisson models after controlling for long- and short-term patterns as well as for the effect of weather. Meteorological records were reviewed to identify dust-storm days and analyses were repeated to quantify their effect on cardio-respiratory morbidity. **RESULTS:** For every 10 microg/m³ increase in daily average PM₁₀ concentrations, there was a 0.9% (95%CI: 0.6%, 1.2%) increase in all-cause and 1.2% (95%CI: -0.0%, 2.4%) increase in cardiovascular admissions. With respect to respiratory causes, an effect was observed only in the warm months. No lagged effects with levels of PM₁₀ were observed. In contrast, positive associations with levels of ozone were only observed the two days prior to admission. These appeared stronger for cardiovascular causes and independent of the effect of PM. All-cause and cardiovascular admissions were 4.8% (95%CI: 0.7%, 9.0%) and 10.4% (95%CI: -4.7%, 27.9%) higher on dust storm days respectively. In both cases the magnitude of effect was comparable to that seen on the quartile of non-storm days with the highest levels of PM₁₀. **CONCLUSION:** We observed an increased risk of hospitalization at elevated levels of particulate matter and ozone generally consistent with the magnitude seen across several European cities. We also observed an increased risk of hospitalization on dust storm days, particularly for cardiovascular causes. While inference from these associations is limited due to the small number of dust storm days in the study period, it would appear imperative to issue health warnings for these natural events, particularly directed towards vulnerable population groups.

Source: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2517071>

Resource Description

Exposure : ☐

weather or climate related pathway by which climate change affects health

Air Pollution

Air Pollution: Dust, Ozone, Particulate Matter

Geographic Feature: 

resource focuses on specific type of geography

Freshwater, Urban

Geographic Location: 

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : Cyprus

Health Impact: 

specification of health effect or disease related to climate change exposure

Cardiovascular Effect, Respiratory Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular hospital admissions

Respiratory Effect: Other Respiratory Effect

Respiratory Condition (other) : respiratory hospital admissions

Population of Concern: A focus of content

Population of Concern: 

populations at particular risk or vulnerability to climate change impacts

Children

Resource Type: 

format or standard characteristic of resource

Research Article

Timescale: 

time period studied

Time Scale Unspecified